

PRICE  
15¢

PERIODICAL ROOM  
GENERAL LIBRARY  
UNIV. OF MICH.

NOV 10 1930

# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



NOVEMBER 8, 1930

Fitting the Skeleton of the Tallest Building  
See Page 297

A

SCIENCE SERVICE PUBLICATION

## SCIENCE NEWS LETTER

Vol. XVIII

No. 500

The Weekly  
Summary ofCurrent  
Science

Published by

## SCIENCE SERVICE

The Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

Edited by WATSON DAVIS

Subscription rates—\$5.00 a year postpaid. 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Special reduced subscription rates are available to members of the American Association for the Advancement of Science.

In requesting change of address, please give old as well as new address.

Advertising rates furnished on application.

## Board of Trustees of Science Service

*Honorary President*, William E. Ritter, University of California. Representing the American Association for the Advancement of Science, J. McKeen Cattell, *President*, Editor, Science, Garrison, N. Y.; Burton E. Livingston, Johns Hopkins University, Baltimore, Md.; Raymond Pearl, Director, Institute for Biological Research, Johns Hopkins University, Baltimore, Md. Representing the National Academy of Sciences, John C. Merriam, *President*, Carnegie Institution of Washington; R. A. Millikan, Director, Norman Bridge Laboratory of Physics, California Institute of Technology, Pasadena, California; David White, Senior Geologist, U. S. Geological Survey. Representing National Research Council, Vernon Kellogg, *Vice-President and Chairman of Executive Committee*, Permanent Secretary, National Research Council, Washington, D. C.; C. G. Abbot, Secretary, Smithsonian Institution, Washington, D. C.; Harrison E. Howe, Editor of Industrial and Engineering Chemistry. Representing Journalistic Profession, John H. Finley, Associated Editor, New York Times; Mark Sullivan, Writer, Washington, D. C.; Marlen E. Pew, Editor of Editor and Publisher, New York City. Representing E. W. Scripps Estate, Harry L. Smithson, *Treasurer*, Cincinnati, Ohio; Robert P. Scripps, Scripps-Howard Newspapers, West Chester, Ohio; Thomas L. Sidlo, Cleveland, Ohio.

## Staff of Science Service

Acting Director, Vernon Kellogg; Managing Editor, Watson Davis; Staff writers: Frank Thone, James Stokley, Emily C. Davis, Jane Stafford, Marjorie Van de Water, J. W. Young; Librarian, Minna Gill; Sales and Advertising Manager, Hallie Jenkins.

Copyright, 1930, by Science Service, Inc. Reproduction of any portion of the SCIENCE NEWS LETTER is strictly prohibited since it is distributed for personal, school, club or library use only. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service, details and samples of which will gladly be sent on request.

Publication Office, 1930 Clifton Ave., Baltimore, Md. Editorial and Executive Office, 21st and B Sts., N. W., Washington, D. C.

Address all communications to Washington, D. C. Cable address: Scenservc, Washington.

Entered as second class matter October 1, 1926, at the postoffice at Baltimore, Md., under the act of March 3, 1879. Established in mimeographed form March 13, 1922. Title registered as trade-mark, U. S. Patent Office.

## DO YOU KNOW THAT

Only one diamond in 25 is flawless.

The prickly pear cactus, which covers millions of acres of land in Australia, is being fought back by insect enemies imported into that country.

The U. S. Women's Bureau is directed by a woman and employs women in its work almost entirely.

It has been estimated that there are about 3,000 different kinds of fish in the Amazon and its tributaries.

Observations of sleeping persons indicate that the average individual changes his position 33 times in the course of a night's sleep.

The United States has seven per cent. of the world's population.

The United States has at least 85 species of native goldenrod.

The first printing press to be set up in the New World was established in Mexico in 1536.

Two English women have crossed Africa by motor from Cape Town to Cairo, a journey that required over five months.

The true sardine or pilchard occurs only in European waters, but species closely resembling it and loosely called sardines are found in America.

By means of a new process, aluminum articles are now being made in a variety of colors.

Indians who make a fire with a drill can produce a spark and catch it for use in less than a half minute.

American universities conferred ten times as many doctor's degrees in the sciences in 1930 as they did in 1900.

## WITH THE SCIENCES THIS WEEK

ARCHAEOLOGY		Scrapbook of Science	302
American "Stonehenge"	297	MEDICINE	
Hurry to Save Ancient Writings	297	Best Bacteriophage Needed	303
Modern Master of Stone Age		Nobel Prize Winner	296
Tools	295	Pneumonia is Many Diseases	297
Undisturbed Tomb Found	296	MICROPHOTOGRAPHY	
ASTRONOMY		Details Smaller Than a Light	
Shaw Neglects Scientists	293	Wave	291
Star Gazers Ready for Meteors	294	OPTICS	
BACTERIOLOGY		Still Views With Depth Effect	292
Bacteria Turn Bolshevik	296	PHYSIOLOGY	
BOTANY		Runner 23 Per Cent Efficient	293
Shellbark Hickory—Nature		PHOTOGRAPHY	
Ramblings	303	Runner 23 Per Cent Efficient	293
CHEMISTRY		PSYCHOLOGY	
Dyed Clothes Always Shrink	296	Learning of Negro Children	295
INDUSTRIAL CHEMISTRY		PUBLIC HEALTH	
Chardonnet on Artificial Silk—"A		Cancer Education Urged	299
Classic of Science"	298	Air Pollution Commission	
ENGINEERING		Suggested	300
Bad Odors to Warn Miners	297	SOCIOLOGY	
Torch of Steel Cutter	297	\$280 A Year for College Girls	296
GENERAL SCIENCE		ZOOLOGY	
First Glances at New Books	304	Mule Deer Adopt Rabbits	303

Science Service presents on the radio, an address,  
TELLING THE NATION'S TIME

By Captain Julius F. Hellweg, superintendent of the United States Naval Observatory in Washington, where nightly observations of the stars are used to check the clocks that keep time for the whole country.

Friday, November 14, 1930, at 3:45 p. m., Eastern Standard Time

Over Stations of  
The Columbia Broadcasting System

## MICROPHOTOGRAPHY

# Ultraviolet Reveals Details Shorter Than Visible Light

**Blurred Ring Becomes Sharp Spines in Highly Magnified Pictures Taken With Short Wavelength Light**

**A** NEW method of taking photographs through the microscope, that will reveal about a fifth again as much as ones taken with ordinary methods, was announced by Dr. A. P. H. Trivelli, of the Eastman Kodak Co., and Leon V. Foster, of the Bausch and Lomb Optical Co., before the Optical Society of America meeting at the University of Virginia last week.

The new method involves taking the photomicrographs with ultraviolet light, which, in itself is not new, but which has formerly required the use of special lenses of quartz or fluorite and special slides for the preparation of the material to be examined. For the short ultraviolet rays formerly used, glass is opaque, and so ordinary glass lenses and slides could not be employed.

Though Dr. Trivelli and his associate use ultraviolet light, they use waves just a little shorter than visible violet light, that is, waves about 1/70,000 of an inch in length. Expressed in the scientist's units for wavelength, this is 3650 angstroms, an angstrom being a ten millionth of a millimeter, or about a 250 millionth of an inch. Visible light includes the range of wavelengths from about 4000 angstroms for the shortest violet rays to around 7000 for the longest red. Ultraviolet light down to even less than 3650 is transmitted by ordinary glass lenses and slides, though very much shorter waves are absorbed.

## Mercury Arc Is Source

The source of the light is a mercury arc lamp, giving the purple light often used in photographic studios. As the ultraviolet light is not visible, and it is necessary to focus the microscope, they make use of a band of green light in the illumination for this purpose. Two filters are used. One transmits only this green color, and is put between the light and the microscope when it is being focussed. Then another filter, that transmits only the ultraviolet component of the light, is sub-

stituted and the photograph made. The lenses are constructed so that both the ultraviolet and the green light rays are focussed at the same place.

Dr. Trivelli showed examples of photographs made with the new equipment. One was of hollyhock pollen magnified 300 diameters. With the picture made by ordinary light a gray ring appeared around the grains, but in the ultraviolet pictures this appeared distinctly as a number of sharp spines.

## May See Molecules

Ultraviolet photography with the microscope has been used to reveal germs invisible with ordinary means, and with it so much simplified by the method of Dr. Trivelli and Mr. Foster, it is likely that more research workers will be able to use it. The reason that it shows greater detail is found in the short wavelength of the ultraviolet light. The microscope will not show details smaller than the length of a single light wave, so by using shorter waves, smaller things are revealed. With X-rays, far shorter yet, very much

more minute objects might be seen, even the molecules of matter themselves. Unfortunately, no one has yet invented a method of focussing X-rays and so they cannot be used in this way.

*Science News Letter, November 8, 1930*

## PALEONTOLOGY

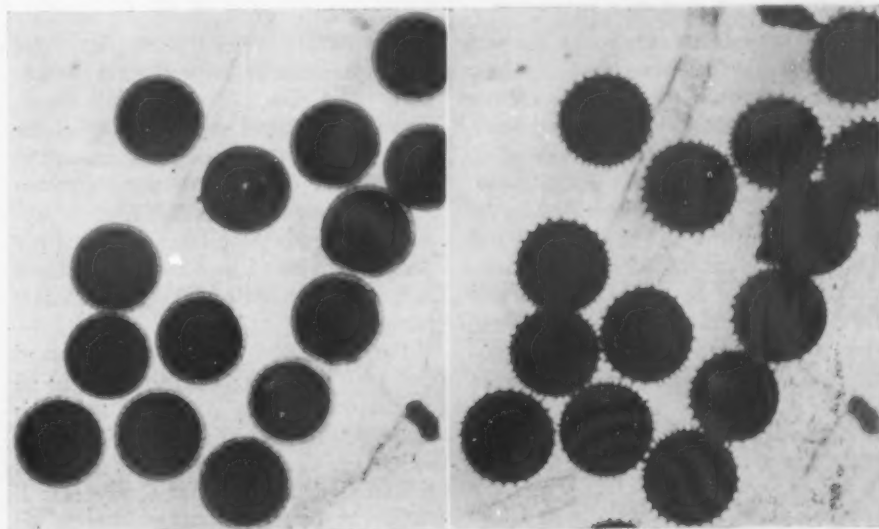
## Ice Age Whale Fossils Found in Michigan

**E**XCELLENTLY preserved fossils of sea-going whales which visited the Michigan peninsula during the ice age have been discovered in two Michigan localities, Prof. Russell C. Hussey of the University of Michigan geology department has announced.

Some twenty to thirty thousand years ago the whales swam inland by way of the St. Lawrence or the Hudson waterway, through the prehistoric glacial lakes and into shallow rivers at the edge of the retreating ice sheet which then covered northern North America. The whales caught in the rivers could not turn around and find their way out, and Prof. Hussey believes they must have died of starvation. Their bones were cast upon the beaches of those times and are found today in gravels.

As found at both localities, one ten miles out of Ann Arbor and the other in Oscoda county in the northern part of Michigan, the bones are bleached white with backbone and ribs perfectly preserved. The University of Michigan hopes to acquire one skeleton for exhibition purposes.

*Science News Letter, November 8, 1930*



## INVISIBLE LIGHT TOOK THE SECOND PICTURE

The first shows hollyhock pollen, 200 diameters, ordinary light used. The second, in which the blurred rings become sharp spines, is the product of a new method of using light of 3,650 angstroms, a wave length shorter than those of visible light.



## OPTICS

# Still Views with Depth Effect Projected for First Time

**Method is Theoretically Applicable to Movies But Cost Would be Very Great, Dr. Ives Tells Optical Society**

**N**O SUCCESSFUL means of projecting stereoscopic movies, without requiring some sort of mask or goggles before the observer's eyes, has yet been invented, but members of the Optical Society of America, meeting at the University of Virginia, last week, saw for the first time a method of doing it with still pictures. Dr. Herbert E. Ives, of the Bell Telephone Laboratories, under whose direction their work in television has been carried out, demonstrated the method, which is his invention.

Even with still picture projection, the apparatus used here was very crude and projected small pictures, visible to only a few at a time. However, Dr. Ives pointed out, the methods used are capable of refinement. But he held out no hope of true stereoscopic movies by such means in the near future.

"These methods are theoretically applicable to the projection of motion pictures in relief," he said. "The complexity and cost of apparatus for satisfactory motion picture projection would, however, be very great."

## Started With Father's Invention

Dr. Ives' method traces its ancestry to an invention of his father, Frederic E. Ives, inventor of the half-tone process used to reproduce photographs in newspapers and magazines. This was called the parallax stereogram. As with ordinary stereo pictures, intended to be viewed in the double lens stereoscope, two pictures were made from two viewpoints, separated approximately the distance between the two eyes. These were both printed on a glass transparency consisting of fine vertical strips, so that every alternate strip presented the view seen from one point and the intermediate ones the other. A grating consisting of opaque and clear strips the same width was carefully adjusted and fixed just in front of the picture. Then, when looked at from the correct position, this grating covered one set of strips for the right eye and the other

for the left, so the picture stood out in full relief.

Dr. Ives a few years ago elaborated this and made what he called the parallax panoramagram, a device which was invented independently by Dr. C. W. Kanolt, formerly of the Bureau of Standards. This was taken with a special form of moving camera. The result was a picture made up of strips, but each strip consisted of a minute panorama of that part of the subject, from a number of viewpoints. This was viewed through a grating, in which the clear strips were much narrower than the opaque ones, so that when viewing the picture from any direction the eye saw the parts photographed from a similar direction. When looked at with two eyes, each saw the proper part and stereoscopic relief was obtained. The advantage of this was that the picture did not need to be viewed from a certain angle.

## Improvements

Dr. Ives has now developed this further. In one method he replaces the grating with a film on which are embossed narrow vertical ribs, like those used for amateur color motion picture film. The ribs act as cylindrical lenses, directing the light the same way as the clear strips in the grating, but are not as wasteful of light. Another improvement is obtained with this film to produce a stereoscopic picture that does not need to be viewed with the light behind, but can be handled like an ordinary photograph.

For projection, Dr. Ives has worked out two methods, both of which he demonstrated. In one, the screen is made up of a series of vertical glass rods, each designed so that the light is reflected back in the same way that it came. A battery of many lanterns all project on this screen, each projecting a view of the original subject made from a particular angle. Each picture can be seen from only one direction, so each

eye sees its proper picture, but for satisfactory results an enormous number of separate projectors would be needed.

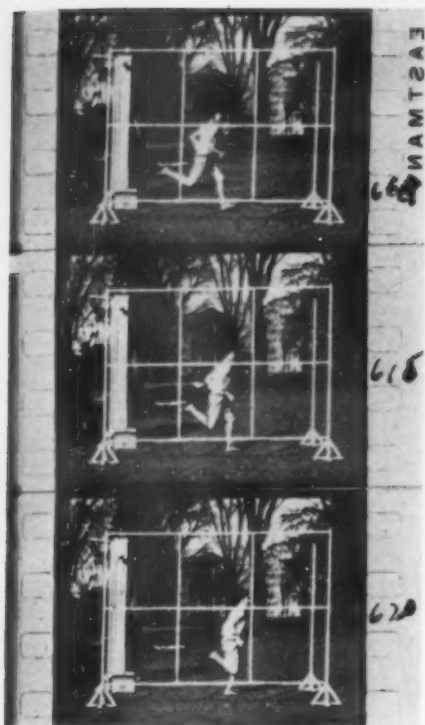
The other method is to use a screen of rods, so shaped that when viewed, one sees only light from a very narrow strip on the back. By means of a very accurate lens, a parallax panoramagram, as used for the smaller pictures, is projected on the back of this screen, and the strips of the pictures registered with those of the screen with great precision. Then, when viewed from the front, the audience sees a stereoscopic picture. Neither method is practicable for motion pictures under present conditions, because of the large number of separate films and projectors that would be required for the first and the extraordinarily great accuracy needed in the projection of the second.

## Other Developments

Television from color movie film, with all the colors reproduced; a method of securing television reproduction of fine detail without the use of extraordinarily wide frequency bands, either by radio or wire; and improved reproduction of color values in two way television; these are other late advances described by Dr. Ives.

The transmission of color movie film is done with the Kodacolor process, used in amateur 16 millimeter movie cameras. In this process a series of minute ridges running the length of the film yields a positive film in which the image is made up of a series of fine horizontal lines. The position of these lines with respect to the ridges determines the color which they show on the screen. This is because the ridges act as cylindrical lenses and direct the light for the screen picture through one or more of three vertical color filters placed before the lens.

For the television arrangement, a scanning disc, with a series of fine holes, rotates in front of the film as it moves in front of a light. Then a lens projects the image on to three photoelectric cells side by side. No color filters are used, but the cells are arranged so that one picks up the red image, one the green and one the blue. In the television receiver, which is the same as that used in previous experiments in transmitting color images from real subjects, the current from each of these cells is fed into a glow lamp which reproduces the original color. The light from these three lamps is combined, and so the eye sees the reproduced image in full color.



MEASURING A RUNNER'S EFFICIENCY

These three views, chosen five pictures apart so that greater change of position is shown, are among 2,000 taken by Dr. C. A. Morrison. The falling ball on the left is used to time accurately the runner's movements.

PHYSIOLOGY—PHOTOGRAPHY

## Efficiency of Runner Shown As 23 Per Cent by Movies

AS A MACHINE, the body of a runner doing a hundred yard dash is only 23 per cent. efficient, C. A. Morrison, of Eastman Teaching Films, Inc., told the Society of Motion Picture Engineers at their recent meeting in New York. Mr. Morrison described work that he had done in collaboration with W. O. Fenn in using movies to analyze the mechanical energy expended by the sprinter.

By measuring the oxygen utilized by the runner, physiologists have found that the amount consumed is equivalent to the production of 13 horsepower. High speed motion pictures were made of runners at the University of Rochester. In this way they found that the runner has an output of only 3 horsepower in actual mechanical work so

ASTRONOMY

## More Names Added to Shaw's List of Universe Makers

Scientists in America and Europe Have Assisted Einstein And Developed Worthy Theories of Their Own

ALBERT EINSTEIN may well be, as George Bernard Shaw declared, the "greatest of our contemporaries," but there are other men working in similar or related lines that also may occupy a prominent place in some future history of "universe makers."

Willem de Sitter, the modern Dutch astronomer who has applied some of Einstein's ideas to form a theory of a finite yet limitless universe that differs in important respects from that of the German, is one. Another is Sir Arthur Eddington, leading English student of relativity. Recently Sir Arthur called attention to the works of Father Le Maitre, of the University of Louvain, in Belgium, and at one time connected with the Harvard College Observatory. Le Maitre's idea of a continually expanding universe reconciles some of the chief difficulties of the older ideas.

In America there is Dr. Ludwik Sil-

berstein, of Rochester, who has made studies on the size of the universe that indicate that it may be much smaller than was formerly supposed. Dr. R. C. Tolman, of the California Institute of Technology, has worked out a theory of the universe on the basis of observational results obtained at the neighboring Mt. Wilson Observatory. These were obtained first by Dr. Edwin P. Hubble, and later also by Milton Humason, and showed distant nebulae apparently moving away with tremendous speeds, many thousands of miles a second. Dr. Tolman interprets this as an illusion, due to the structure of space.

Shaw's list of "universe makers" included Pythagoras, Aristotle, Ptolemy, Nicolas Copernicus, Galileo Galilei, Johann Kepler, Sir Isaac Newton and Albert Einstein. Among the names that might be added to this list are the following: Hipparchus, who really invented the theory known under Ptolemy's name; Aristarchus of Samos, who lived from 310 to 230 B.C., and who anticipated Copernicus by suggesting that the earth revolves in a circular orbit around the sun; Eudoxus of Cnidos, who placed the sun, stars and planets on crystal spheres with the earth at the center, providing the foundation for Hipparchus, and lived about 367 B.C.; Thales of Miletus, about 580 B.C., the first known great astronomer, who broke away from the mythological ideas then in vogue, and suggested that the earth was a disc floating in water; Anaximander, of 610 to 545 B.C., the first to recognize that the heavens form a sphere which revolves around the north star; Tycho Brahe, 1546 to 1601, Danish nobleman who proposed that the sun revolved around the earth, but that the other planets revolved around the sun, thus providing a stepping stone from the Ptolemaic theory to the Copernican; and Sir William Herschel, 1738 to 1822, who was the first to make a scientific study of the universe of stars, rather than merely the solar system.

Science News Letter, November 8, 1930

Science News Letter, November 8, 1930

## ASTRONOMY

# Star Gazers Ready to Watch Famous Meteor Shower

Leonids, to Fall Friday and Saturday, May be More Numerous Presaging a Great Shower in 1933 or 1934

By JAMES STOKLEY

STAR gazers who are particularly interested in meteors, or "shooting stars," prepare for a busy time. Next week brings one of the most famous of meteor showers, and though it is not as dependable as the shower in August, the most famous of all meteoric displays have been of the November meteors. These were the great showers of 1799, 1833 and 1866, when the sky was covered with meteors like the ribs of a great umbrella. A similar shower was expected for 1899, but it failed to materialize.

There is some reason to believe, however, that 1933 or 1934 should bring a return. If so, they should now be getting more numerous than in recent years, and so astronomers, as well as the active group of amateurs who help them observe meteors, will be anxiously watching the sky this month, noting the numbers of shooting stars that appear on certain particular nights, and the way they move. No great astronomical knowledge is required to assist in this work, so if you want to engage in a simple bit of research that will be a real help to science prepare to look for meteors late at night next Friday and Saturday, November 14 and 15.

## Seem to Come From One Point

This shower is known as the Leonid shower of meteors, because they all seem to radiate from a point called the radiant in the constellation of Leo, the lion. Leo does not rise until late, but if you look to the northeast at midnight, you will see the familiar "Sickle." The handle of the sickle points to the east point of the horizon, and the blade points upwards. The radiant of the Leonid meteors is in the curve of the blade. Actually, the meteors do not radiate from this point; it is an effect of perspective that makes them seem to do so. Imagine that you are looking into a long, well-lighted, railroad tunnel. The tracks, and all the other lines parallel to them, seem to come together in

the distance. It is just the same with the meteors. They are moving in parallel tracks, and when we look in the direction from whence they come these tracks also seem to come together.

Dr. Charles P. Olivier, professor of astronomy at the University of Pennsylvania, and leading meteor authority, gives some facts about the Leonid meteor stream in his new book, "Comets," just published by the Williams and Wilkins Co. The stream forms an ellipse 1,900,000,000 miles long, or about twenty and two-thirds times the distance from the earth to the sun. This ellipse has an eccentricity of .9, which means that its length is 2.29 times its width.

## Analogy of the Inner Tube

"Let us take the inner tube of an automobile tire and bend it into such an ellipse," says Professor Olivier in this book. "Put the sun at one focus, and have the diameter of the tube equal to the distance that the earth goes in passing through the stream each November, making due allowance for the crossing not being at right angles. Now consider the tube sparsely filled with meteors, all moving in the same direction, and taking  $33\frac{1}{4}$  years to make a complete journey from perihelion (the point nearest the sun) to perihelion again. But for a part of this stream, of such length that it takes three years to pass the earth's orbit as it comes towards the sun, the meteors are much more closely packed, and in the very middle of this 'three year section' packed very closely indeed.

"The earth passes through this tube about the middle of each November, usually meeting only the sparsely scattered Leonids. But at 33- or 34-year intervals it goes through the dense part and for three or four years we have much finer showers. And if, as in 1799 and 1833, the earth happens to hit the very dense part,—the 'gem of the ring', as it is sometimes called—then we have a grand meteoric shower."

However, at some times when there



## PATH OF A METEOR

Joseph Klepesta was making a celestial photograph at the Prague Observatory in Sept., 1923, when a meteor sped across in front of his telescope. Thus he accidentally took this remarkable picture. The bulges in the trail were caused when the meteor flashed out somewhat more brightly than usual for a moment.

should have been a shower, none occurred, as in 1899. Professor Olivier explains this by saying that "as the group which should have met us in 1899 was on its way Jupiter happened to be in the part of its orbit very near the meteors' orbit." The result was that the gravitational attraction of Jupiter, largest of all the planets, pulled them towards himself, and so switched the main stream aside sufficiently to cause it to miss the earth, as it passed us in 1899. By 1901 Jupiter had moved on and so the tail end of the main stream did reach the earth, giving us "quite a respectable, if not brilliant, shower in November of that year."

## Cautious Prediction

Professor Olivier is properly cautious about predicting another brilliant display in 1932, 1933 or 1934, remembering the failure of the 1899 display to live up to predictions, and the "black eye" that was thus given astronomy in the public estimation.

"It all depends," he says, "upon the perturbations suffered by the main groups of Leonids in the past thirty-three years. No one appears to have attempted to calculate these perturbations, which present a most troublesome problem. So far as an off-hand opinion goes, the main stream meantime may have been switched either towards or from us. In the first case we should see



a really fine shower, in the latter next to nothing. We simply do not know yet what to expect." These meteors are really part of a comet. In 1866, a European astronomer, named Tempel, discovered a comet which has since borne his name. The orbit of the comet is almost the same as that of the meteor swarm, and so it seems quite certain that the meteors are the debris of the comet.

Even more marked is the relation between a second meteor shower of November and another comet, for when the comet disappeared, it left a meteor shower in its place. These meteors are called the Andromedes, because they radiate from the constellation of Andromeda, and occur between November 17 and 27. They are not very numerous now, however, though several brilliant showers have been recorded.

But the Leonid shower is something

else, and it is in their observation that the amateur can help. Watch the northeastern sky on the night of Nov. 14 and 15, especially after midnight. The greatest display comes between 3:00 and 4:00 a. m. The moon will be just past last quarter and will shine rather brightly in the eastern sky, so that fainter meteors may be lost in its glare. But if you look carefully, you should be able to count ten or so an hour under ordinary circumstances, and perhaps many more if we are beginning to get into the main swarm of the Leonid stream. If possible, draw the path of each meteor among the stars, but if you don't want to do that, count the total number of meteors in half hourly intervals. Send any records of the meteors to Dr. Charles P. Olivier, Flower Observatory, Upper Darby, Pa., to whom they will be most welcome.

*Science News Letter, November 8, 1930*

## PSYCHOLOGY

## Fewer Trials for Negro Children But Whites Excel in Speed

**N**EGRO children, when given a test of learning to associate certain numbers with letters as in a code, were able to learn in fewer trials than those required by white children, but the white children excelled in speed.

The trial was made by Prof. Lyle H. Lanier, of Vanderbilt University at Nashville, who gave individual tests to nearly 500 12-year-old white and negro children in three typical cities: Nashville, Tenn.; Chicago, Ill.; and New York City. Full details of the study are reported in a current issue of *Comparative Psychology*.

*Science News Letter, November 8, 1930*

## ARCHAEOLOGY

## 84-Year Old Man is Master Maker of Stone Age Tools

**Taught by Studying Ancient Evidence Indians Left, He Has Made Thousands of Arrow Heads and Scores of Axes**

**T**HE "LOST ART" of manufacturing flint arrow points and granite hammers, like those used by ancient and primitive men, has been successfully revived by a modern hunter, according to a report from Beloit Museum, Beloit, Wis., by Alonzo W. Pond, archaeologist.

For years, the report states, Halvor Skavlem has studied the evidence afforded by the good and rejected stone weapons lying about the Indian village site at his summer home on Lake Koshongong. Seventeen years ago he first attempted to shape a bit of flint into an arrow point, using a pointed bone for a tool as he imagined an Indian hunter would have done.

A good many archaeologists and amateurs have made such experiments as this first one, the report points out, but Mr. Skavlem has "revived the art for he has made thousands of arrowheads and scores of axes in the past seventeen years, using only the tools available to primitive man. He has done this quickly in the presence of thousands of witnesses with the skill of a true artist

who knows the limitations of his medium and who is master of his technique."

Some other experimenters have said they can demonstrate how flakes are removed in the shaping of stone tools and weapons, the report continues, but they admit that they cannot explain it to others. The Wisconsin arrow-maker has analyzed the primitive techniques and has explained the types of blows and angles of fracture which the Indians used to produce their arrows, hammers, spear heads, and axes.

An ordinary stone arrow point can be shaped in two to five minutes, by this modern master of stone age craft. Within half an hour he can produce the groove of a stone axe. This is cited by Mr. Pond as good evidence that stone age weapon making proceeded with reasonable speed and efficiency, and was not the long, tedious, and difficult labor which it has sometimes been described.

Mr. Skavlem, who is eighty-four years old, is continuing his experiments with the primitive stone worker's art.

*Science News Letter, November 8, 1930*



### MODERN STONE AGE TOOL

This axe with groove, wedged seat and finished polish was made by Mr. Skavlem, of Wisconsin, in four and a half hours. Most axes left by Indians are less finished and doubtless required less time. The blocks on the left show how cuts were made with the axe.

## MEDICINE

## 1930 Nobel Prize Won By Blood Group Discoverer

**D**ISCOVERY that human blood is of four different types and that blood of one type does not always mix with blood of another type has won the 1930 Nobel prize in medicine for Dr. Karl Landsteiner of the Rockefeller Institute for Medical Research.

The enormous importance of Dr. Landsteiner's discovery has been evident to patients who have had the life-saving operation of blood transfusion performed. For this operation the blood of the donor and that of the patient must mix well, or serious and even fatal results may occur. Consequently before each transfusion, samples of the two bloods are tested or "matched" to see if they are compatible and belong in compatible blood groups.

When the blood liquid of one normal, healthy person and the red blood cells of another are put in the same test tube, instead of mixing freely the red cells often clump together as if they were glued, Dr. Landsteiner observed during the course of some investigations made in Vienna in 1900. Scientists call this glueing together or clumping, agglutination. When it happens in a man's vein, following blood transfusion, death may result.

Agglutination did not take place at random, Dr. Landsteiner found, but depended on certain definite properties of the blood. It is on the basis of these properties that blood was divided into different groups or types. Three of the types were discovered by Dr. Landsteiner and the fourth by two of his students.

Every human being belongs to one or the other of the blood groups. To a certain extent, blood groups are inherited, and this fact is often used to determine paternity. If the blood groups of each parent are known, one can state to which groups their child might belong.

*Science News Letter, November 8, 1930*

## BACTERIOLOGY

## Bacteria Eat Plants They Normally Feed

**B**OLSHEVIK bacteria, forsaking their normally useful lives of labor and rioting and robbing because they are hungry, have been discovered by scientists at the Rothamstead Experimental Station near London. They are the ordinary nodule bacteria of clover,

which capture nitrogen from the air and make it available for the food of higher plants. Ordinarily they are not harmful parasites, demanding only a little carbohydrate food from their hosts in exchange for their work. But if this fails they begin to feed on the living protoplasm of the clover cells, and then attack the cell walls themselves.

It has been found that this bolshevistic behavior of bacteria follows boron starvation in the host plant. The higher plants require the element boron in extremely minute amounts, to be reckoned in millionths of an ounce. If this tiny helping of boron is missing their system of transportation tubes breaks down and the tissues no longer receive their normal supplies of food. The bacteria, finding themselves on short rations, then proceed to stage their bread riots.

*Science News Letter, November 8, 1930*

## ARCHAEOLOGY

## Undisturbed Tomb Found in Mesopotamia

**D**ISCOVERY of an ancient tomb that has remained undisturbed for many centuries is reported from Tell Billa in northern Mesopotamia, where an expedition sponsored by the University of Pennsylvania Museum is excavating under the direction of Dr. Ephraim A. Speiser.

The tomb contains a sarcophagus made of terra cotta. There is an assortment of pottery and some beautiful bronzes. In a preliminary report of the discovery, received here, Dr. Speiser states that the tomb appears to date from the Persian Achaemenid dynasty which ruled from about 540 B.C. to about 330 B.C. when the conquests of Alexander the Great ended its reign. Ancient tombs which have not long ago been plundered of their contents are seldom found by archaeologists, museum officials stated in commenting on the importance of the discovery.

Tell Billa, one of the largest and most imposing mounds in ancient Assyria, attracted the attention of Dr. Speiser four years ago. At that time a surface examination of the site revealed that the huge mound contained extensive remains, both pre-historic and historic. The find that spurred Dr. Speiser on to further research was an inscribed brick bearing the seal of Sennacherib, Assyrian king of Biblical fame. This indicated that the mound contained one of the summer palaces of this famous royalty.

*Science News Letter, November 8, 1930*

# IN SCIENCE

## CHEMISTRY

## Impossible To Dye Clothes Without Shrinkage

**D**YEING clothes without shrinking them is practically an impossibility today, Paul C. Trimble of the National Institute of Dyers and Cleaners, Silver Spring, Md., has found through experiments.

In warning cleaners against incurring liability for the shrinkage of dyed clothes, Mr. Trimble said that there is almost no exception to the rule that modern fabrics shrink in the dyeing process. Clothing worn by our grandmothers was better in this respect, he said. The old practise was to shrink clothes in finishing them, whereas modern methods of manufacture require that the material be stretched by the finisher instead of being shrunk in accordance with the old tradition.

Sometimes after the material is stretched by the finisher, it is set with gelatine to hold it to its new dimensions. Such material, according to Mr. Trimble, sometimes even shrinks while still on the bolt.

The dampness of perspiration is sometimes enough to shrink fabrics treated in this manner.

*Science News Letter, November 8, 1930*

## SOCIOLOGY

## \$280 a Year Per College Girl For Clothes, Figures Show

**T**HE AVERAGE college girl spends \$280.13 during the calendar year for clothing, and over a third of this goes for dresses and similar garments. This average figure was obtained from the actual expenditures of 341 girls in two typical colleges, one in Iowa and the other in sunny Florida. The investigation was made by Callie May Bliss of the Iowa State College at Ames.

The average for the northern college is practically the same as that for the Florida institution; the Iowa girls bought fur coats, but the Florida girls spent more for dresses.

*Science News Letter, November 8, 1930*



# ENGINE FIELDS

## ENGINEERING

### Torch of Steel Cutter Hastens Skyscrapers

See Cover Picture

**A** TOUCH of beauty found in the erection of the steel frame for the world's tallest structure is presented on the front cover as a photographic study of a steel cutting torch at work. The picture was taken by Lewis W. Hine, of Hasting-on-Hudson.

With his oxy-acetylene torch the operator will halve the huge steel beam in just a few minutes, an operation that would require hours with a saw. This is a method of modern building that hastens the erection of skyscrapers.

The Empire State building in New York City, on which the photograph was taken, will tower 1,248 feet above Fifth Avenue and Thirty-fourth Street. Eighty-four floors will rise to a height of 1,048 feet, and above this level there will be a mooring mast for dirigibles and an observation gallery. Work was begun March, 1930, and it is expected that the building will be completed by May 1, 1931.

*Science News Letter, November 8, 1930*

## ARCHAEOLOGY

### American "Stonehenge" Found in Colorado

**I**NDIANS in Colorado long ago constructed for their religious rites mysterious circles of stones that call to mind the great stone circle at Stonehenge in England, is the discovery by Prof. E. B. Renaud, of the University of Denver, as the result of an expedition on behalf of Science Service.

Professor Renaud, who has just made a long difficult journey over prairie trails to investigate the local rumor of an Indian fort, found that the "fort" was really a series of circles of gray and brown sandstone slabs set on a high cliff overlooking the Apishapa River and the surrounding country.

The circles of stones would have had no usefulness as a defense. Nor are they like rings marked off for wigwams. The labor involved in carrying the slabs and aligning them according to a pattern can hardly be justified unless the

enclosure had some ceremonial function, Professor Renaud concluded.

The Colorado circles are not constructed on so grand a scale as the prehistoric Britons achieved at Stonehenge, but the Indians had a most impressive setting for their rites. One group of circles ranged from one pace to nine paces in diameter, and the group was more or less surrounded by a slab fence with an opening at one end. At another site along the Apishapa, Professor Renaud discovered another group of circles made of larger monoliths, and here he found that each circle had an upright stone post in the center.

"A solar cult may be suggested by the circular shape and the presence of a central monolith," Professor Renaud reported.

Nothing similar to the stone circles has been reported heretofore, to Professor Renaud's knowledge, in the Southwest states.

*Science News Letter, November 8, 1930*

## ARCHAEOLOGY

### Scientist Hastens to Save Ancient Picture Writings

**T**HE RACE to save the mysterious rock pictures of the Susquehanna River before a huge power project submerges the rocks beneath tons of water will be won, is the confident belief of Donald A. Cadzow, director of archaeological research of the Pennsylvania Historical Commission.

For weeks Mr. Cadzow and his group of a dozen men have worked twelve hours a day and sometimes far into the night, rescuing as many of the ancient picture writings as they can before the work starts on the \$35,000,000 dam to be built by the Safe Harbor Water and Power Company. The construction work, which will bury the picture rocks under 40 feet of water, is to be started in 1931.

"We are 'finger-printing' the rock carvings that can be found," Mr. Cadzow explained. "We are making charts, moulds, and plaster models of them all. When this work is finished most of the legible carvings will be lifted bodily from the river and shipped to Harrisburg. Once in the State Museum, they will be available to the general public and for study by the archaeologist."

That the petroglyphs, or rock carvings may be very old, older than the Algonkian and other tribes known to have inhabited the region, is the suggestion advanced by Mr. Cadzow.

*Science News Letter, November 8, 1930*

## MEDICINE

### Pneumonia May Be More Than One Disease

**"T**HERE is no one disease, pneumonia," declared Dr. Rufus Cole, director of the Hospital of the Rockefeller Institute, speaking at the Graduate Fortnight of the New York Academy of Medicine. Success in preventing the disease or diseases will not be realized until physicians are able to diagnose them according to cause, and not according to anatomy.

Instead of one disease, pneumonia, a whole group of diseases of the respiratory tract exists. These differ among themselves in cause, in their effect on the tissues, body and in symptoms.

For many years infections of the respiratory tract have been designated according to the part they attacked. For example, the term bronchitis suggests that only the bronchi are involved. Bronchopneumonia is the name used when only the air spaces close to the bronchi are supposed to be involved, while lobar pneumonia indicates that the entire lung is involved.

Progress in prevention of the acute infections of the intestinal tract, of which typhoid fever is an example, has been greatly aided because these diseases have been classified according to cause. Similar classification of the respiratory diseases would be a step forward in their prevention, Dr. Cole thinks.

*Science News Letter, November 8, 1930*

## ENGINEERING

### Bad Odor Made Standard Warning to Miners

**A** DISAGREEABLE odor, resembling that of decayed cabbage, rancid butter or banana oil, will be used to warn workers in metal mines of fire. It will be shot to threatened miners at the rate of thousands of feet a minute mixed with oncoming fresh air.

Recognizing this method of warning as the most effective, the American Standards Association has made it a part of the American Standard code for fire fighting in metal mines. As a result of its becoming a part of the national code, the method will undoubtedly be employed in many mines, an official of the American Mining Congress states.

While pleasant odors have been experimented with, disagreeable odors have been found preferable because of their more positive effect.

*Science News Letter, November 8, 1930*

INDUSTRIAL CHEMISTRY

# Chardonnet on Artificial Silk

## "A Classic of Science"

**A famous chemist presents an early view of a discovery which has since developed into great industry**

No slur on the genuineness of the product, but rather exultation in another victory over nature, was meant by "artificial" silk as Chardonnet used it. Nitrate silk made by his process is one of the "rayons" of commerce today, though three other processes are also in use. In all the underlying principle is the same. Cellulose is dissolved, the solution is squirted through a small hole into a liquid which will solidify the cellulose again in the form of a continuous thread. This thread is then handled like that of any other textile.

### SUR UNE SOIE ARTIFICIELLE.

*Note de M. Chardonnet, présentée par M. A. Cornu. Comptes Rendus hebdomadaires des Séances de L'Académie des Sciences, Paris, 1889. Translated for the Science News Letter by Helen M. Davis.*

**I**N the month of May, 1884, when M. Blanchard, president for that year, laid before the Academy of Sciences the problem of imitation of silk, I sent the Secretary a sealed communication, opened at the meeting of November 7, 1887, summing up my first studies on this question.

The continuity of thread, its transparency, the interior play of light, the silky sheen, could only be obtained by making thread from a liquid solution. Cellulose ought to do, but it does not have a true solvent: it would be necessary to nitrate it, to thread it as collodion, and then to relieve it of a part of its nitric acid.

Various celluloses may be used, on condition that they are pure and are not changed by the reagents. I have directed my attention chiefly to cotton and sulphite wood pulp.

With these materials, a pure cellulose octonitrate is formed, and dissolved in the ratio of 6.5 to 100 in a mixture of 38 parts of ether and 42 of alcohol.

This collodion is held in a tinned copper reservoir, where an air pump maintains a pressure greater than atmospheric, it flows down an incline in

which are set glass tubes ending in a capillary portion A. A second tube B surrounds each of the first and receives an excess of water by the tubulure C. This water, held back by a covering of rubber D, falls back around B. The collodion, driven out through the opening A, is immediately solidified, at the surface, upon contact with the water, and falls with this water, in the state of a thread, around B; there, tongs automatically driven catch it and carry it to bobbins turning above. The threads from neighboring orifices are united into a kind of raw silk. Each orifice is provided with a stop-valve to regulate the size of the thread. In the industry, in order not to lose the solvent, orifices and bobbins are enclosed in a glass case, where the same amount of air is constantly reheated at the entrance to the machine (to dry the thread) and cooled at the outlet (to condense the vapors). The skeins are handled like cocoon silk. After this they go on to the denitrification.

The various pyroxyles lose their nitric acid in a warm reducing bath and also in pure water, but the reaction is more complete in dilute nitric acid. The nitric acid is removed from the cellulose by *dissociation* which progresses faster the hotter and more concentrated the bath, but which can be pushed the further as the bath is cooler and the more dilute. I use nitric acid of density 1.32; the temperature is allowed to fall slowly from 35° to 25°. At the end, the cellulose should be gelatinous, particularly apt to absorb by endosmosis various substances, especially coloring matter and salts. It gives off no more than 100 cc. to 110 cc. of nitrogen dioxide per gram. The solvents of collodion have no more effect upon it, the threads have lost their explosive properties and can be used without danger in most applications, especially combined with other textiles; but it is possible to make them less combustible perhaps than the hemp or cotton used



### THREADS OF ARTIFICIAL SILK

*Are made by this model which is on exhibit in the U. S. National Museum. It differs from a commercial machine only in having one spinneret instead of many*

with them by absorbing, upon leaving the nitric bath, some ammonium phosphate. (This last combination, of cellulose and salt, on account of water held hygrometrically, loses 85 cc. to 90 cc. of nitrogen dioxide per gram.)

The density of artificial silk, about 1.49, is comprised between that of raw silk (about 1.66) and that of manufactured silk (about 1.43). The tensile strength varies from 25 kg. to 35 kg. per square millimeter (30 to 45 for raw silk from the cocoon, 15 or 20 to 100 or less for manufactured silk). The elasticity of natural and artificial silks is analogous (elasticity of test, that is to say, elongation before rupture, 15 to 25 in 100; true elasticity, 4 to 5 in 100 approximately). The diameter of artificial silk can vary from less than 1 *mu* to more than 40 *mu*; the flexibility can therefore be regulated to suit the desired end. The *brilliance* surpasses that of cocoon silk itself.

It can also be dyed by ordinary processes; artificial silk is indeed the only fiber which behaves in the bath about

like cocoon silk (on condition that it is not heated too much). Although I have not had at my disposal either complete equipment or trained workmen, I can exhibit at the Champ-de-Mars some samples imitating all the types of silk.

The section of artificial silk threaded into water (as is described above) shows every staple in the form of a fluted cylinder: this is caused by shrinkage of the center after solidification of the envelope. If the water is replaced by alcohol, the superficial skin remains retractile and the cylinder circular.

We have tried to modify the process by dissolving the pyroxyle in acetic acid to incorporate it into the gelatine; but the thread becomes friable and loses all its practical value.

I close with the observation: the thread of silk formed of two filaments of fibroin joined by the sericin (grès) must be, it seems to me, the product of two different secretions; the fibroin must be already formed in the *silk organs*; the sericin must be secreted by the lips of the spinnerets; the contact of the two liquids must bring about their coagulation. I venture to call this point to the attention of naturalists.

*Science News Letter, November 8, 1930*

For generations ink has been a successful household remedy in the Philippines for the treatment of burns, Dr. C. A. Stammel, Captain, M. C., U. S. Army, has reported from Zamboanga, P. I., to the American Medical Association. The surprising thing is that a scientific basis for the treatment exists, although it has only just been revealed.

Most black inks are simply weak solutions of an iron and tannic acid compound, Dr. Stammel pointed out, and scientists have recently discovered that tannic acid itself is an efficient method of treating burns.

**NEXT WEEK'S 141ST CLASSIC**  
is by

**Johann Kepler**

discoverer of planetary lanes  
who died

**THREE HUNDRED YEARS**  
**AGO**

**November 15, 1630**

PUBLIC HEALTH

## Cancer Education Urged Pending Discovery of Cure

**Public Health Association Also Hears Reports of Botulism Increases and of Tides Making Mussels More Poisonous**

ORGANIZATION of each state to fight cancer through its board of health, medical society and university, using educational programs and clinics as the weapons, was proposed by Dr. Joseph Colt Bloodgood of Baltimore, at the meeting of the American Public Health Association in Fort Worth, Texas, last week.

"In spite of many laboratories throughout the world searching for a cure or means of prevention, nothing is in sight, and as yet there is no protection against death from cancer except education," Dr. Bloodgood declared.

He described in detail the Massachusetts state program for the control of cancer. In this state the board of health is directed by law to maintain and advertise cancer clinics on a certain number of days throughout the year in as many localities as possible, and money has been appropriated for their maintenance.

Our only effective treatments for cancer today, surgery and irradiation with X-rays and radium, do not permanently cure more than one tenth of the cases that come late for treatment. These same methods applied early in the disease effect permanent cures in from thirty to seventy per cent. Consequently education is a vital factor in the control of the disease.

"Until in the laboratories we have found the cause, prevention and cure, something must be done on a world-wide plan which will inform the public and the children about the protection that is possible today," he said.

This educational program need not mean the encroachment of state medicine on private practice, he indicated. The most valuable preventive medicine can be practiced by the family physician who not only cares for the sick but also makes periodic examinations of well people and acts as a bureau of information on the best and latest methods of prevention of disease and the regulation of health. However, for those who cannot afford a family physician, clinics must be provided.

"The great leaders in public health today recognize cancer as a world public health problem, as a local problem in the smallest places. Every modern student of cancer knows that in the skin and mouth cancer is a preventable disease, and believes that if every woman who has borne children received a periodic examination, cancer of the cervix can be placed among the preventable diseases," Dr. Bloodgood concluded.

### Botulism Increases Reported

A definite increase in the number of cases of botulism has occurred during the past two years, was reported by Dr. K. F. Meyer, director of the Hooper Foundation for Medical Research of the University of California. With the exception of two cases of botulism traced to shalots packed in Italy, home preserved vegetables, fruits, fish and meats have been the products responsible for the cases of poisoning in the recent outbreaks.

Botulism is a type of food poisoning caused by the presence in the food of an organism called *Clostridium botulinum*. This organism liberates a very powerful poison which causes illness and often death in persons eating infected food. Certain types of food are particularly apt to contain the organism, and home canned or preserved foods are more apt to have it now than commercial products.

### Poison Follows Tides

Pacific Coast mussels are most poisonous soon after or during the maximum tides of the year, Dr. K. F. Meyer, director of the Hooper Foundation for Medical Research of the University of California, reported.

Mussels collected at various places, from as far south as Monterey Bay to as far north as the mouth of the Klamath River near the northern border of California, contain a small amount of typical mussel poison at any time of the year.

"Since the mussels are consumed in large quantities without ill effects by the population along the coast, it is reason-



able to conclude that the 'slightly toxic' mussels are not important from the standpoint of public health," Dr. Meyer said.

The mussels became most poisonous between the first week of July and the last week of August. The sale of mussels has consequently been forbidden during the past two summers in California, and the state department of health regularly issues a warning against their use during the period when this food is particularly liable to be dangerous.

Since the serious outbreak of mussel poisoning in July, 1927, in San Francisco and vicinity, the problem has been investigated by Dr. H. Sommer and his assistants. Clams, it was found, contain a poison very similar to that of mussels.

Poisonous mussels emanate a typical odor of cyanide, which is very faint in most cases, however. The digestive gland of the harmful shell fish is usually larger and softer and often of a greenish color and lighter or darker than the normal.

#### Health Contest Winners

Milwaukee, Wis., Syracuse, N. Y., East Orange, N. J., White Plains, N. Y., and Sidney, Ohio, were the winners in

the first Inter-Chamber Health Conservation Contest sponsored by the U. S. Chamber of Commerce, it was announced at the meeting of the Health Association. The object of the contest is to assist in reducing economic losses

in the United States due to unnecessary illness and death.

The contest for 1929 was so successful that a similar one has been started for 1930, and 183 cities have already enrolled.

*Science News Letter, November 8, 1930*

PUBLIC HEALTH

## Air Pollution Commission Suggested to Health Officials

### Oxygen of Air is More Important Than Food and Drink, Yet Edibles Get Most Attention, Dr. Sappington Says

A COMMISSION on air pollution, similar to milk commissions, ventilation commissions and the like, was suggested by Dr. C. O. Sappington of the National Safety Council at the symposium on atmospheric pollution held in Fort Worth, Texas, before the American Public Health Association.

"You can go for days without food; you may even do without water for a considerable number of hours; but it is a matter of minutes when it comes to the necessity of breathing uncontaminated air with the requisite amount of oxygen," Dr. Sappington declared.

#### Old Methods for New Problem

"It is a fact that men have always paid more attention to food and drink than to the air which they breathe in spite of the greater importance of oxygen to the body," he continued. "This may be the reason for our accomplishments in the field of regulation of water, milk and food supplies. The mechanism through which these changes have been brought about is by education of the public and regulatory legislation. These same means are at our disposal in the solution of the problem of atmospheric pollution. It is my belief, however, that much more can be done by the dissemination of adequate information than through the passage of laws."

Specific methods of reducing air pollution were described by Howard W. Green of the Cleveland Health Council.

"Supervision by competent technical men of design and installation and of the operation of all plant equipment burning fuel will in time reduce the preventable air pollution to a minimum," Mr. Green prophesied. "The most optimistic feature in this whole

problem lies in the fact that in most cases the necessary improvements result in sufficient savings in the fuel bill and labor expense to pay the cost of the improvements within a short period of time, in some cases within a period of a year or a year and one-half.

Mechanical stokers, proper construction of chimneys, electrification of locomotives, attention to types of fuel, and installation of auxiliary oil or gas burners in incinerator plants, were among the suggestions he made.

How air pollution affects the health of the people was described by Dr. T. C. Terrell of Fort Worth.

"Carbon monoxide gas is one of the most universally feared forms of atmospheric pollution," he said. Less than half the amount of this gas necessary to cause death, is enough to cause headache, dizziness, weakness and other symptoms.

Two diseases which occur frequently in industrial centers are pneumoconiosis and silicosis. These are produced by inhaling particles of silica and carbon with the air. Many of the particles are returned with the expired air, but a certain proportion remains in the lungs and air passages. These particles affect the cells and eventually a diseased condition results.

The air may also be polluted by the presence of bacteria and of plant pollens. From germ pollution may result diphtheria, influenza, whooping cough, pneumonia, scarlet fever, and tuberculosis, while hay fever and asthma are caused by pollen pollution. Investigations showed that the disease germs in New York dust varied from 300,000 to 3,000,000 per gram, one gram being about one twenty-eighth of an ounce.

*Science News Letter, November 8, 1930*



16 or 35mm

#### EDUCATIONAL FILMS

With Spoken Lectures  
or  
Classroom Titles

# This is the reason for this remarkable book!

**YOU** are writing to express your objection to the policy a friend is pursuing. Naturally, it requires tact. What word expresses the explicit degree of your disapproval? Shall you admonish or criticize? Rebuke or reprimand? Or is there a better word you can't recall at the moment?

Turn to March and choose, in a few seconds, your exact word from the 72 verbs in our language expressing *disapproval*.



The business man finds through it a new clarity and forcefulness in presentation of ideas.

**THIS** is the essence of the great helpfulness of this Treasure House of Words and Knowledge—March's Thesaurus Dictionary.

The use of the right word is of utmost importance. For words have amazing powers. They launch great corporations, move nations, change history. To their skilled masters they bring the world's richest treasures.

But every day men lose opportunities, lose prestige, fail because of unwise choice of their words. The world judges *you* by your words. Dream great dreams, conceive big ideas, but if you can't express them clearly you achieve an undeserved reputation for loose thinking.

**WITH** such power awaiting one's command, why has it seemingly been locked beyond reach? With all of the rich expressiveness of the English Language, how utterly exasperating not to be able to remember or find the one word to visualize an important idea, or express your exact shade of meaning!



To the educator it offers the ideal method of teaching better choice of words.

From the time of Dr. Johnson's first Dictionary to the present, lexicographers have said, in effect, "If you know the word, here is its meaning." The ordinary thesaurus, book of synonyms, or vocabulary book has fallen short of real usefulness

by either giving no meanings to the words listed or offering fragmentary definitions of little value.

It took a man with the experience and knowledge of Professor Francis Andrew March, a philologist of unquestionable authority, to give to the world this book which truly unlocks the language—which not only guides the user to the right word, but defines it so clearly that there is no doubt of its meaning and fitness for his purpose—March's Thesaurus Dictionary.

**CONSIDER** what March offers you. Instead of a vocabulary limited by your memory, it places the whole living language at your command. Instead of "blind man's buff" hunting or guessing, you merely flip a few pages and have the word you need, grouped with related words, clearly defined, with words of opposite meaning in adjoining columns.



To the writer it is an unending source of inspiration.

*With arrow-like directness and speed, it gives you the power of the right word.*

This is why thousands of copies are being used in business and professional offices, as well as in schools and homes.

This is why a leading writer's publication advised its readers that if they could afford but one book to select March's Thesaurus Dictionary.

This new Edition, with the Amplified and Revised Appendix, contains many additional word facts. The important words of leading arts and sciences, for instance, compiled by Science Service, Inc. Complete chapters on Grammar, Composition, Word Derivations, Geographic Facts and Americana.



The ideal reference book for the home.

The coupon below offers you the opportunity to

**Test March in your own home or office—at our risk.**

See for yourself what complete mastery of the language its 1462 pages give you. Try it for ten days on your word questions.

If you don't find in that time that it has become indispensable, you have but to return it and the trial has cost you nothing.

## HISTORICAL PUBLISHING CO.

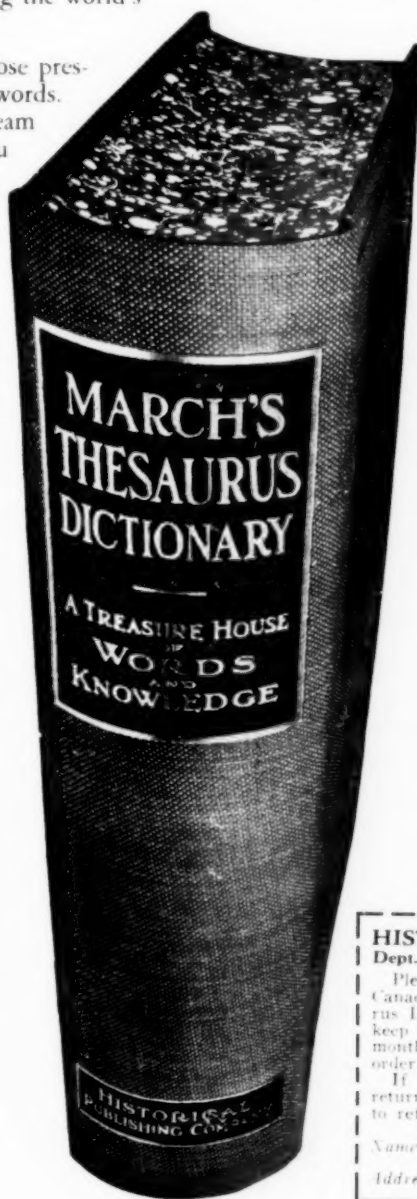
Dept. SC-11, 1334 Cherry Street, Philadelphia, Pa.

Please send me (postpaid in U. S.—express paid in Canada) the new Amplified Edition of March's Thesaurus Dictionary. I will pay \$3.75 on delivery, and if I keep the book will pay you \$2.00 per month for three months. Canada, duty extra; Foreign, \$10.00 cash with order.

If for any reason I do not wish to keep it, I will return it in good condition within 10 days and you are to refund my \$3.75.

Name .....

Address .....



## • Notebook of Science

### Punishment Teaches Chicks

PUNISHMENT in the form of confinement for just one minute in a narrow passage helped four little five-week-old Rhode Island Red chicks to learn to distinguish between contrary directions in the revolution of two striped drums. The little chickens were rewarded by food when they went in the direction of the drum revolving from left to right; they were punished when they chose the drum turning from right to left. They learned in from 20 to 60 days.

The experiment was conducted at Harvard University Psychological Laboratory by Prof. William H. Stovsky of Harvard and Frank A. Pattie, Jr., of the Rice Institute.

### Hibernating Mosquitoes

IN THE higher reaches of the Rocky Mountains in the northern portion of Montana lives a species of mosquito that hibernates during the winter as adults, under logs and in sheltered spots, and may be seen flying on the

first warm day of spring. These mosquitoes are large, with spotted wings, and often are referred to as snow mosquitoes.

According to Drs. N. Kadletz and L. Kusmina, Russian scientists, these mosquitoes store up fat in the summer, as do bears, and subsist on it while dozing through the winter.

### Paralysis Decreases

A DECIDED decrease in the number of cases of infantile paralysis throughout the country is seen in the reports of state health officers to the U. S. Public Health Service here.

For the week ending Oct. 25, a total of 397 cases were reported. This is a decrease of 171 cases compared with the week before, and is the lowest figure reported in the last six weeks. The high point of the present outbreak occurred during the week ending Oct. 4 when 647 cases were reported.

While the infantile paralysis outbreak is declining, reports show an increase in diphtheria. A total of 1,664

cases were reported for the week of Oct. 25. A general increase in this disease usually occurs at this season.

Health officers generally advise parents to have their young children tested for susceptibility to diphtheria, and if found susceptible, to have them protected by treatment with toxin-antitoxin.

### Parrot Ban Lifted

THE BAN on the importation of parrots into the United States, which became effective last January during the psittacosis outbreak, has just been lifted, the U. S. Public Health Service has announced. Parrots may now be brought into the country through ports where federal quarantine officers are stationed, subject to certain regulations of shipping, detention and inspection.

### Enjoy High Temperature

TEMPERATURES that ordinary animals and plants could not endure for more than short periods are built up and apparently enjoyed by the fungi that breed in piles of rotting straw. Experiments at the Rothamstead Experimental Station near London show that these organisms of decay thrive best at a temperature of about 130 degrees Fahrenheit, which is more than halfway from freezing to boiling point. These fungi, it has been found, do more than the bacteria often found associated with them toward the reduction of straw to a soil-enriching fertilizer resembling farmyard manure.

### Quinine Anniversary

PHARMACOLOGISTS, physicians and botanists gathered at the Missouri Botanical Garden, St. Louis, last week for the celebration of the three hundredth anniversary of the first use of cinchona bark, from which we get quinine, for the treatment of malaria. This anniversary coincides with the fiftieth of the discovery by Alphonse Laveran of the parasites causing the disease.

### Neuritis and Auto Drivers

NEURITIS of the neck and shoulder has become a common complaint of automobile drivers in France, a report to the American Medical Association states. It attacks almost exclusively persons who drive closed cars and leave the window next to them open so they may put their hands out to give signals. Drivers of left-drive cars are affected on the left side, drivers of right-drive cars on the right side. Persons who drive open cars are not affected.

Science News Letter, November 8, 1930



**BIRD  
and  
NATURE  
GLASSES**

of first quality  
optical  
and  
mechanical  
construction

used by  
leading bird and  
nature students

No. P5171

Black binoculars featuring Japanese mounting. Each one is supplied in leather carrying case with shoulder strap.

No. P5171 with 3 1/2" (88mm) objective lens without loops and neck strap \$6.75

No. P5171 with 3 1/2" (88mm) objective lens with loops and neck strap 7.20

**PALCO COMPANY**

TELESCOPES      MICROSCOPES      PRISM BINOCULARS      MAGNIFIERS

153 WEST 23rd STREET      NEW YORK, N. Y.



BOTANY

*Nature Ramblings*

By FRANK THONE



Shellbark Hickory

THOSE of us who have or can remember a rural or semi-rural boyhood background will remember the shellbark or shagbark hickory with mixed emotions. It bears about the finest nuts of any of our native trees—but it also bears the limberest and roughest switches! And as for sawing up a cord of hickory stovewood.

Most of us, however, will remember the nuts better than we do the switches, and in most places hickory wood has become much too precious to be sawed up and burned. As a matter of fact, the lack of enough hickory trees was one of the few things that ever turned Henry Ford aside from an announced purpose. Mr. Ford a few years ago tried to buy up enough woodland to supply wheel spokes for his vast family of small cars, but in the end he had to give it up and take to wire spokes. The hickories have simply been cut away to such an extent that they can no longer supply spoke-wood.

The same qualities that made the hickory switch dreaded in the little red school-house days made hickory wood desirable for spokes, tool handles, and a host of similar uses. It combines great resilience with great strength, and can have a load thrust upon it with a far many thousands of times before it finally begins to loosen up and weaken. The American Indians, lacking the yew wood that made the bows of Old England supreme among pre-gunpowder weapons, used hickory a good deal in making their bows.

The shagbark or shellbark hickory got its name from its habit of splitting and peeling off its outer bark in long, thin chunks. The ground under an old tree is frequently littered like a tanyard with these rags of its discarded garments.

*Science News Letter, November 8, 1930*

☛ We sent you this sample to let you see the NEW . . . Science News Letter.

☛ You are invited to send your subscription at the special rate of \$3 (saves \$2) to the A. A. A. S. using this coupon.

To the Permanent Secretary,

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE,  
Smithsonian Institution Building, Washington, D. C.

As a member of the A. A. A. S., I am entitled to the privilege of subscribing to the SCIENCE NEWS LETTER at the special reduced price of \$3 and I am therefore enclosing that amount, for which please enter my subscription to the SCIENCE NEWS LETTER for the year beginning Oct. 1, 1930. Please ask the publishers to send me the issues that have appeared since October 1.

Name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

## TEACHERS COLLEGE



## The College of Liberal Arts and Sciences

### The Degree of Bachelor of Arts

Standard Curriculum based on best academic experience. Embraces the six great fields of learning, Pure Science, English Language and Literature, Mathematics, Foreign Languages, History and Social Science, and Philosophy.

### EVENING COURSES OFFERED

- |                                     |                         |
|-------------------------------------|-------------------------|
| 1. Chemistry                        | 4. Construction         |
| 2. Social Studies                   | 5. Mechanical Design    |
| 3. Heat Treatment and Metallography | 6. Architectural Design |
|                                     | 7. Aviation             |

For further information send for Bulletin on courses in which you are interested



## TEMPLE UNIVERSITY

Broad Street at Montgomery Ave., Phila., Pa.



## First Glances at New Books

### Astronomy

**COMETS**—Charles P. Olivier—*Williams and Wilkins*, 246 p., \$3.50. Among the various subjects that have been neglected in recent scientific works is the interesting one of comets. Not since the revision of Chambers' famous book, "The Story of the Comets," in 1910, has a modern book on the subject appeared in English. Professor Olivier, who in 1925 produced the first book on meteors since 1871, now remedies the lack of works on comets with this thoroughly interesting book that will be welcomed alike by astronomer and layman. In many respects it is a sequel to his earlier book on meteors, since the two classes of celestial bodies are so closely related. Separate chapters are devoted to specific comets of special interest, such as Halley's, Biela's, Moorehouse's, Pons-Winnecke's and 1910a. Detailed accounts are given of the meteor crater in Arizona and the similar formations resulting from the 1908 meteoric collision in Siberia, both of which, Dr. Olivier contends, were really results of collisions of the head of a small comet with the earth. In his final chapter, on conclusions, he gives a new theory of the source of comets. Professor Olivier's leading position in the field of meteoric astronomy gives the book authority, and his ability to write simply and interestingly gives it a popular appeal, so that it deserves to attain a large distribution.

*Science News Letter, November 8, 1930*

### Biography

**THE STORY OF A SURGEON**—Sir John Bland-Sutton—*Houghton Mifflin*, 204 p., \$3.50. The book was suggested by Rudyard Kipling, who has written a preamble for it. It consists of musing reminiscences of a distinguished English surgeon. His experiences were numerous and varied, as were his interests. Since the book is not all medical, it may be read with pleasure by the layman as well as the physician.

*Science News Letter, November 8, 1930*

### Psychology

**HUMAN NATURE**—Max Schoen—*Harper*, 504 p., \$2.50. A very up-to-date "first book" in psychology, both as to subject matter and educational form. Where older text books used to give dry-bone facts of science, leaving it to the skill of a teacher to bring the bones to

varying degrees of life, the new texts add comment and conversational discussions, and take special pains to acquaint the student with recent research. In short, the writer boldly gives the course, instead of a foundation for a course. Prof. Schoen handles this method of text-book writing very successfully, and steers amicably amid the structural and behavioristic theories, finding good in both points of view.

*Science News Letter, November 8, 1930*

### General Science

**OUR ENVIRONMENT: ITS RELATION TO US**—Harry A. Carpenter and George C. Wood—*Allyn and Bacon*, 234 p., \$1.20.

**OUR ENVIRONMENT: HOW WE ADAPT OURSELVES TO IT**—Harry A. Carpenter and George C. Wood—*Allyn and Bacon*, 391 p., \$1.60.

**OUR ENVIRONMENT: HOW WE USE AND CONTROL IT**—Harry A. Carpenter and George C. Wood—*Allyn and Bacon*, 704 p., \$1.80.

These three volumes, Books I, II, and III of the Modern Science Series for Junior High Schools, edited by James M. Glass, give the reader in clear and readable form an introduction to science as it is applied in everyday life. The first volume deals mainly with physical geography; the second with astronomy, meteorology, horticulture, and sanitation; the third with physics, physiology, and hygiene. All subjects are dealt with from the point of view of the individual and the interrelation between him and his environment. The books are beautifully and profusely illustrated.

*Science News Letter, November 8, 1930*

### Ichthyology

**THE CANDIRU**—Eugene W. Gudger—*Hoebner*, 120 p., \$1.50. An able discussion of tales and superstitions concerning a strange fish, the candiru, which is found in certain South American rivers. Of interest chiefly to biologists and scientific travellers.

*Science News Letter, November 8, 1930*

### Medical History

**STALKERS OF PESTILENCE**—Walter W. Oliver—*Hoebner*, 251 p., \$3. With a preface by Dr. Theobald Smith. The book is a short, comprehensive, carefully written history of medicine.

*Science News Letter, November 8, 1930*